



Department of Energy

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Mr. James A. Saric, Remedial Project Manager U.S. Environmental Protection Agency Region V-SRF-5J 77 West Jackson Boulevard Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager **Ohio Environmental Protection Agency** 401 East 5th Street Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF CERTIFIED FOR CONSTRUCTION DESIGN PACKAGES FOR THE SOUTH FIELD EXTRACTION SYSTEM, INJECTION DEMONSTRATION AND SOUTH PLUME OPTIMIZATION PROJECTS AND PROJECT-SPECIFIC PLAN FOR THE INSTALLATION OF **EXTRACTION WELL NUMBER 22**

Reference: Letter from J. Reising to J. Saric and T. Schneider, "Responses to Comments on The Tasks 4 and 5 Pre-Final Design Package," dated May 7, 1997.

This letter transmits the "Certified for Construction" (CFC) design packages for the South Field Extraction System, Injection Demonstration and South Plume Optimization projects. Also transmitted is the Project-Specific Plan (PSP) for the installation of Extraction Well Number 22. The drawings, specifications, and PSP are for your information only. For ease of handling and mailing, the above drawings have been issued at one-half scale.

If you have questions concerning this transmittal, please contact Robert Janke at (513) 648-3124, or John Kappa at (513) 648-3149.

Sincerely

Yohnny W. Reising

Fernald Remedial Action

Project Manager

Enclosure: As Stated

FEMP: Kappa





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PROJECT SPECIFIC PLAN FOR THE INSTALLATION OF EXTRACTION WELL 22

PROJECT NUMBER 50.03.34.01

JUNE 1997

Prepared by

Fluor Daniel Fernald

Prepared for

U.S. Department of Energy Fernald Field Office

Under Contract DE-AC05-92OR21972

PROJECT SPECIFIC PLAN EXTRACTION WELL 22 PROJECT NUMBER 50.03.34.01 June 1997

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1.0 INTRODUCTION

This Project Specific Plan (PSP) serves as the controlling document for the installation of Extraction Well 22, at the location depicted on Figure 1. Extraction Well 22 is a component of the South Field Restoration Module. The justification for the installation of Well 22 is provided in the <u>Baseline Remedial Strategy</u> Report, Remedial Design for Aquifer Restoration (Task 1). This well will be identified in the site database system as Well 32276. A 20 inch diameter borehole will be drilled for the installation of a 12 inch diameter extraction well, Figure 2. The borehole will be advanced to a depth of approximately 102 feet bgs (based on surface elevation of 565 feet amsl). All drilling and sampling field activities will conform to the guidelines set forth in the Sitewide CERCLA Quality Assurance Manual (SCQ), unless otherwise specified in this PSP. Performance of the requirements specified in standard operating procedure ADM-02, Field Project Pre-Requisites, shall precede all field activities. The extraction well installation process will include Rotosonic drilling for the collection of soil samples, cable tool drilling to accommodate well installation, well installation, and well development.

2.0 MANAGEMENT AND ORGANIZATION

Drilling activities will be conducted by a qualified subcontractor under the direct supervision of Fluor Daniel Fernald (FDF). All sampling activities defined in this PSP will be performed by FDF. Descriptions of some of the key technical responsibilities of project personnel or organizations are provided below.

The DOE Operable Unit 5 Team Leader is responsible for:

- Providing direction and oversight to the completion of PSP activities
- Acting as the point of contact within DOE and for the regulators and stakeholders for all communications concerning work carried out under this PSP.

The FDF Aquifer Restoration Project Director is responsible for:

- Providing overall project management and technical guidance to the FDF team
- Ensuring the necessary resources are allocated to the project for the efficient and safe completion of PSP activities
- Overseeing and auditing PSP activities to ensure that the work is being performed efficiently and in accordance with all regulatory requirements and commitments, DOE Orders, site policies and procedures, and safe working practices.

The FDF Project Manager is responsible for:

- The safe and prompt completion of work outlined in the PSP
- Oversight and programmatic direction of sampling activities
- Providing a technical lead for the collection and interpretation of sampling data
- Establishing and maintaining the scope, schedule, and cost baseline
- Reporting to the DOE Operable Unit 5 Team Leader and FDF Aquifer Restoration Project Manager on the status of PSP activities and on the identification of any problems encountered in the accomplishment of the PSP
- Obtaining the necessary funding to complete the sampling and data analysis activities

The FDF Technical Lead is responsible for:

- Reporting to the FDF Project Manager on the progress of PSP activities

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3.0 FIELD ACTIVITIES

3.1 COLLECTION OF SOIL SAMPLES

The surface elevation of the location for Well #22 has already been surveyed and has been found to be 565.12 feet amst. Sampling depths given below are based on this surface elevation. Soil samples will be collected for sieve analysis prior to the installation of Extraction Well #22. The soil samples will be collected in accordance with DRL-02, Solids Sampling in Drilled Boreholes. The soil boring will be advanced with a rotosonic drilling rig. A 4-inch diameter rotosonic core will be obtained from the top of the saturated aquifer down to a depth of 102 feet bgs. A geologist shall prepare lithologic descriptions of the soil materials and transcribe the information onto a lithologic log. The lithology of the core will be described in approximately 1.5 feet to 5 feet intervals, based upon the judgement of the on-site geologist.

A select number of soil samples (500 ml) will be collected from the core and submitted to the on-site laboratory for particle size analysis via sieves to support the selection of screen slot size and screen length. This depth interval is being targeted based on previous water quality sampling results and the surface elevation of the drilling location. The technical lead will assist the on-site geologist in determining which samples will be submitted for sieve analysis. The sieve samples will be submitted to the on-site laboratory for analyses.

The rotosonic borehole will be allowed to collapse naturally up to the water table. Above the water table the hole will be filled with a mixture of bentonite and sand. This technique was used during the drilling of similar South Field Extraction Wells. A ratio of 15, 50 pound bags of bentonite was mixed with 300 pounds of sand to temporarily abandon the rotosonic hole at location 31550. A similar ratio of sand and bentonite will be used for Well #22.

3.2 WELL INSTALLATION

Following the collection of the soil samples, a cable tool rig shall be used to advance a 20 inch diameter borehole to the depth of approximately 102 feet bgs (based on a surface elevation of 565 feet amsl), see Figure 2. Well installation activities shall be documented by the geologist on a Field Activity Log and Well Completion Log.

Well installation shall be performed in accordance with the requirements outlined below and, unless otherwise specified shall follow the general guidelines set forth in Appendix J of the SCO. The well



screen shall be 12 inches in diameter, wire-wrapped and made of 304 stainless steel. A 5-foot, 12 inch diameter sump shall be attached to the bottom of the well screen. Well risers shall be constructed 12 inch diameter 304 stainless steel. A 40 foot depth interval of 56.5 feet bgs to 96.5 feet bgs (based on a surface elevation of 565 feet amsl) is being targeted for the well screen. This depth was selected to target the thickness of the 20 µg/L total uranium contamination plume identified at Geoprobe TM Locations 12231 and 12194. The actual length and depth of the screen may vary slightly pending sieve analysis results. An objective in screen placement will be to keep the top of the well screen submerged during the remediation in order to assist in preventing iron fouling of the screen. This will be achieved by placing the top of the well screen approximately 8.5 feet below the lowest recorded water level for the area, based on data collected since 1988. The technical lead will advise the field geologist at what depth to place the top of the well screen. The 8.5 feet includes consideration of the dynamic water level which will be achieved during the aquifer restoration when the entire aquifer system is operating.

Native aquifer material will be allowed to collapse around the screen and sump to form a natural filter pack extending five feet above the top of the screen. A 5-foot bentonite seal (pellets) will be installed above the natural or artificial filter pack and a backfill of grout slurry above the bentonite seal shall extend to three feet below ground surface. A 3-foot thick concrete plug will complete the annular seal. Based on the results of the sieve analysis, the FDF Technical Lead may determine that an artificial sand pack is required for proper design of the well. Sand pack size and depths shall be determined based on the results of the sieve analysis as described in Section J of the SCQ. If an artificial filter pack is necessary, the modification will be documented and justified in a Field Change Notice/Variance form approved by the Project Lead.

The riser shall terminate approximately 3 feet above the ground surface. The well will be secured with a lockable well cap.

3.3 WELL DEVELOPMENT

Well development shall be performed as outlined below. Well development shall be initiated no sooner than 48 hours following completion of well installation.

3.3.1 General Requirements for Well Development

Development will begin by surging the well for 24 hours. The surging will progress according to the stroke length of the development rig being used. The stroke length of the development rig will be called the "surge interval." Each surge interval of the well screen will be surged for one hour and the sand

contained in the well, after one hour of surging, will be measured and removed prior to surging the next interval of screen. Surging will begin slowly and gradually increase (i.e., operate the rig slowly then gradually increase power or stroke length if possible).

Following 24 hours of surging, a 6 hour pumping test will be conducted for the purpose of measuring the sand content of the pumped well water. The goal of development will be to produce a well capable of delivering water with a sand content of 10 parts per million (ppm) or less. If sand content is below 10 ppm at the conclusion of the pumping test, development is complete. If the sand content is above 10 ppm at the end of the pump test, the development cycle shall be repeated until the Project Manager determines that development is complete.

3.3.2 Project-Specific Requirements for Well Development

- 1. Lower the surge block to the lower surge interval of the well screen and surge the well for one hour.
- 2. Measure the depth to the bottom of the well. Record the depth in the comments section of the Well Development Form.
- 3. Using a development rig bailer, remove as much sand as possible from the well. Measure the total depth of the well to verify that the sand has been removed.
- 4. Raise the surge block to the next higher surge interval of the screen and surge for one hour.
- 5. Repeat steps 2 and 3.
- 6. Raise the surge block up. Surge the next higher surge interval one hour.
- 7. Repeat steps 2 and 3.
- 8. Repeat steps 2 through 7 lowering the surge block each hour instead of raising it.
- 9. Continue surging in hour intervals until each well has been surged for approximately 24 hours.

3.3.3 Pumping Test

Upon completion of 24 hours of surging, a 6-hour pumping test will be conducted for the purpose of measuring the sand content of the pumped water and the specific capacity of the well. The pumping test will be performed as follows:

- 1. Measure the total depth and the static water level of the well and record the information on the Field Activity Log.
- 2. Pump the well for two hours at a rate that is approximately 1/3 of the design capacity as specified by the field geologist. Measure the water level of the pumping well approximately every 20 minutes.

- 3. Conduct a sand content test after 15 minutes, 30 minutes, 60 minutes, 90 minutes, and 120 minutes of pumping. Steps for conducting a sand content test are provided below.
- 4. After two hours of pumping, increase the pumping rate to 2/3 of the pump design capacity as specified by the field geologist. Pump the well for two hours and repeat the measurements described in 2 and 3 above.
- 5. Increase the pumping rate to the design capacity of the pump as specified by the field geologist. Pump the well at this rate for two hours and repeat the measurements in 4 and 5 above.
- 6. After approximately 6 hours of pumping, stop the pumping.
- 7. Measure the recovery rate of the well by taking water level measurements every 30 seconds until the water level is to within one foot of the static water level recorded before the start of pumping 6 hours earlier.

3.3.4 Sand Content Testing

Sand content will be measured by passing a sample of the pumped well water through a centrifugal sand sampler. The centrifugal sand sampler will be installed in the discharge line used for development, just slightly down gradient of the well head. Operation of the sand content sampler is described below:

- 1. Install the centrifugal sand content tester as directed by the manufacturer. The inlet should be located on the horizontal centerline of the discharge pipe and as close to the discharge head as possible.
- 2. Open the inlet valve to the tester wide open. Adjust the outlet valve to ½ gpm. (This will fill 1 quart in 30 seconds or 1 gallon in 2 minutes).
- 3. Close the inlet valve, remove, clean, and replace the glass tube.
- 4. When ready to start the sand content test, record the start time and open the inlet valve wide open.
- 5. After 5 minutes, record the amount of accumulated sand in the glass tube. Calculate the sand rate by dividing the amount of accumulated sand by 5 minutes (the amount of time to accumulate the sand).
- 6. Periodically check the flow rate through the tester during each run. If the flow rate is not ½ gpm, repeat the test.
- 7. Calculate the rate of sand production per unit of water according to the following calculation:

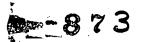
[sand rate (ml/min)]

 $[0.5 \text{ gpm x } 231 \text{ In}^3/\text{gallon x } 16.387 \text{ ml/in}^3]*1E6=\text{ppm}$



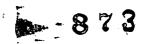
4.0 EQUIPMENT DECONTAMINATION

Drilling and sampling equipment shall be decontaminated to Level I, using a pressure washer to remove visible materials, prior to transport to the drilling location, if the equipment is being moved from a FEMP Controlled Area. Decontamination of the drilling equipment will not be necessary if the equipment has been used previously in a FEMP uncontrolled area. Upon completion of drilling and sampling activities, decontamination of tools and equipment shall be performed to fulfill the Level I specification of the SCQ (Reference Section K).



5.0 WASTE DISPOSAL

Drill cuttings will be spread out on the ground surface near the drilling site and discharged pumping water (during well development) will be sent into the South Plume Force Main.



6.0 HEALTH & SAFETY

EM personnel and project subcontractor personnel shall conform to precautionary surveys performed by the personnel representing the Utility Engineer, Industrial Hygiene, and Radiological Control.

Concurrence to applicable safety permits (indicated by the signature of personnel assigned to this project) is expected from all project personnel in the performance of their assigned duties.

The EM Field Supervisor will ensure that all EM and subcontractor personnel performing project related activities have read or been briefed to the Project Health and Safety Matrix (PHSM), and the applicable surveys that protect worker safety and health. Signing the PHSM is an acknowledgment of reading and understanding it. It is a requirement for all personnel involved in the drilling and sampling activities associated with the well installation. A copy of applicable safety permits/surveys issued for worker safety and health shall be available for reference/review at each sample location, and at the completion of the project, the completed forms shall be submitted for incorporation into the project files.

7.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

Soil Sampling events follow Quality Assurance/Quality Control (QA/QC) protocol established in Section 5 and Appendix J of the SCQ.

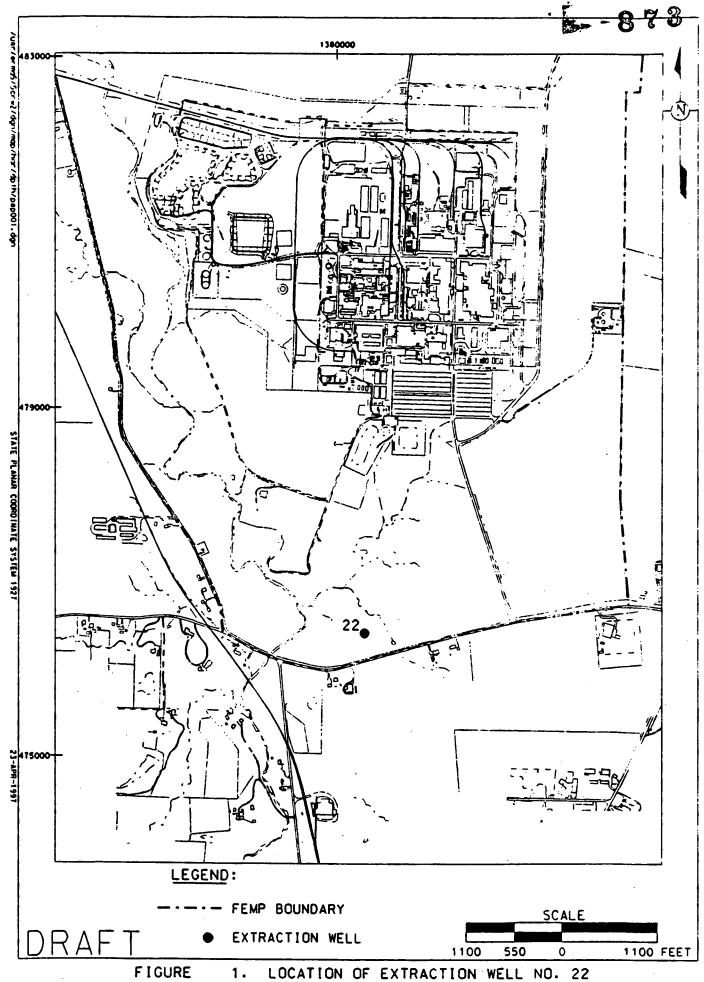
7.1 PROJECT REQUIREMENTS FOR SURVEILLANCE

Self-assessment of work processes and operations shall be undertaken to assure quality of performance. Self-assessment shall be performed by the Project Manager, and shall encompass technical and procedure requirements. Such self-assessment may be conducted at any point in the project.

Independent assessment shall be performed by the FDF QA organization by conducting surveillance. At a minimum, one surveillance shall be conducted, consisting of monitoring/observing ongoing project activity and work areas to verify conformance to specified requirements. Surveillance shall be planned and documented in accordance with Section 12.3 of the SCQ.

7.2 CHANGES TO THE PROJECT SPECIFIC PLAN

Prior to the implementation of changes, the Project Manager shall be informed of the proposed field changes. Once approval has been obtained (verbal or written) from the Project Manager and QA representative for the changes to the PSP, the field changes may be implemented. Changes to the PSP shall be noted on a Variance Request/Field Change Notice (VR/FCN). QA must receive the completed VR/FCN, which includes the signatures of the Project Manager, and the QA Representative, within one week of the granting of the verbal approval.



LOCATION OF EXTRACTION WELL NO. 22

